IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re original application of:

Applicants	:	William Martin et al.
Application Serial No.:		10/014,342
Filing Date	:	November 13, 2001
Title:		AUTOMATICALLY-ACTIVATED HAND-SUPPORTABLE LASER SCANNING BAR CODE SYMBOL READING SYSTEM WITH OMNIDIRECTIONAL AND UNIDIRECTIONAL SCANNING MODES IN ADDITION...
Examiner	:	Jared Fureman
Group Art Unit	:	2876
Attorney Docket No.	:	108-136USA000

entered 12/13/04 AMW

Commissioner of Patents and Trademarks
Washington, D.C. 20231

OK to enter AMW 12/9/2004

AMENDMENT OF THE SPECIFICATION

SIR:

Please amend the present Application as follows:

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Please amend the Specification as follows:

On Page 10, please amend the fourth paragraph as follows:

~~Figure 6 illustrates~~ Figures 6A and 6B illustrate an exemplary system design of an automatically-activated hand-holdable bar code symbol reading device 151' according to the present invention, including a number of cooperating components, namely: control circuitry 611A and a control module 611B that cooperate to perform system control operations to effectuate the system control; a scanning circuit 613 that drives the VLD and laser beam scanning mechanism (e.g., motor of rotating polygon of the laser scanning platform) to thereby produce an omni-directional multiple line scan (or uni-directional single line scan) of a visible laser beam; a scan photoreceiving circuit 615 for detecting laser light reflected off a scanned bar code symbol and producing an electrical signal D_1 indicative of the detected intensity; an analog-to-digital (A/D) conversion circuit 617 for converting analog scan data signal D_1 into a

corresponding digital scan data signal D_2; a bar code symbol presence detection circuit 619 for processing digital scan data signal D_2 in order to automatically detect the digital data pattern of a bar code symbol on the detected object and produce control activation signal A_2; a symbol decoding module 621 for processing digital scan data signal D_2 so as to determine the data represented by the detected bar code symbol, generate symbol character data representative thereof, and produce activation control signal A_3; a data packet synthesis module 623 for synthesizing a group of formatted data packets (that include the symbol character data generated by the symbol decoding module); a data packet transmission circuit 625 for transmitting the group of data packets synthesized by the data packet synthesis module 623 to the base unit 503 (for retransmission to the host device); means (e.g. an object sensing circuit 627 and an object detection circuit 629) for producing a first activation control signal indicative of the detection of an object in at least a portion of the object detection field of the device; an SOS photoreceiving circuit 631 for detecting laser light directed thereto by positioning indicating optical element(s) (such as a lens and light guide or mirror as described above) and deriving timing signal T_{SOS} that is synchronized thereto; a timing signal generator circuit 633 that derives a timing signal T_{SLS} from the timing signal T_{SOS} , wherein the timing signal T_{SLS} is synchronized to the time interval when the laser beam (as redirected by the rotating polygon) provides the uni-directional single line scan (e.g., strikes the central stationary mirror 38C); a VLD duty cycle control circuit 635 that operates (under control of the control circuitry 611A) in the uni-directional (single scan line) scan mode of operation, to control the duty cycle of the VLD of the laser beam production module such that the laser beam is produced therefrom only during those intervals when the laser beam (as redirected by the rotating polygon 36) provides the uni-directional single line scan (e.g., strikes the central stationary mirror 38C); a manually-actuatable data transmission switch 637 for generating control activation signal A_4 in response to activation of the switch 637; a mode switch 639 for generating control activation signal A_5 in response to activation of the switch 639; state indications (e.g. LEDs) 170' that provide a visible indication of the operating state (e.g., object detection state, a bar code symbol presence detection state, bar code symbol reading state, and data transmission state) of the device 151'; and a power control circuit 641, operably coupled to the rechargeable battery supply unit (not shown) of the device 151', that automatically controls (i.e. manages) the availability of battery power to electrically-active

components within the bar code symbol reading device when the device is operated in its hands-on mode of operation (i.e. removed from the scanner support stand) under a predefined set of operating conditions.

On Page 12, please amend the 1st, 2nd, 3rd, 4th and 5th paragraphs as follows:

Figure 7A illustrates an example of the timing signal T_{SOS} produced by the SOS photoreceiving circuit of ~~Figure 6~~ Figures 6A and 6B, including pulses (e.g., a pulse train), each corresponding to a single rotation of the rotating polygon, that are synchronized to the time T_1 when the scanning beam is incident on (or near) the trailing edge of the particular mirror group (e.g., central stationary mirror 38C) that provides the uni-directional single scan line.

Figure 7B illustrates an example of the timing signal T_{SLS} produced by the timing signal generator circuit of ~~Figure 6~~ Figures 6A and 6B, including pulses (e.g., a pulse train) each corresponding to a single rotation of the rotating polygon and each having a leading and trailing edge synchronized to the time interval between T_2 and T_1 when the scanning beam (as redirected by the rotating polygon) strikes the particular mirror group (e.g., central stationary mirror 38C) that provides the uni-directional single scan line.

Figure 7C is an example of Boolean logic expressions that selectively enable the VLD drive circuitry of the scanning circuit of ~~Figure 6~~ Figures 6A and 6B to provide VLD duty cycle control. The first term provides enablement of the VLD drive circuitry in the uni-directional (single scan line) scan mode of operation (which is dictated by the control circuitry 611A with signals $E_{10} = 1$ and $A_5=1$). The second term provides the enablement of the VLD drive circuitry in the omni-directional (multiple scan line) scan mode of operation (which is dictated by the control circuitry 611A with signals $E_{10} = 1$ and $A_5=0$).

Figure 7D is a schematic diagram of an illustrative embodiment of the SOS Photoreceiving Circuit and Timing Signal Generator Circuit used in the system shown in ~~Figure 6~~ Figures 6A and 6B;

Figure 7E is a schematic diagram of an illustrative embodiment of VLD Duty Cycle Control Circuitry used in the system of ~~Figure 6~~ Figures 6A and 6B, to generate timing signals and control the power level of a laser light source during system operation;

On Page 13, please amend the first paragraph as follows:

Figures 9A, 9B, 9C and 9D, taken together, show a high level flow chart of an exemplary control process carried out by the control subsystem of the bar code reading device of ~~Fig. 6~~ Figs. 6A and 6B during the course of its programmed operation.

On Page 33, please amend the 3rd paragraph as follows:

~~Figure 6 illustrates~~ Figures 6A and 6B illustrate an exemplary system design of the hand-holdable bar code symbol reading system 151' including a number of cooperating components, namely: control circuitry 611A and a control module 611B that cooperate to perform system control operations to effectuate the system control as described below in more detail with reference to Figures 8 through 9D; a scanning circuit 613 that drives the VLD and laser beam scanning mechanism (e.g., motor of rotating polygon of the laser scanning platform) to thereby produce an omni-directional multiple line scan (or uni-directional single line scan) of a visible laser beam; a scan photoreceiving circuit 615 for detecting laser light reflected off a scanned bar code symbol and producing an electrical signal D_1 indicative of the detected intensity; an analog-to-digital (A/D) conversion circuit 617 for converting analog scan data signal D_1 into a corresponding digital scan data signal D_2; a bar code symbol presence detection circuit 619 for processing digital scan data signal D_2 in order to automatically detect the digital data pattern of a bar code symbol on the detected object and produce control activation signal A_2; a symbol decoding module 621 for processing digital scan data signal D_2 so as to determine the data represented by the detected bar code symbol, generate symbol character data representative thereof, and produce activation control signal A_3; a data packet synthesis module 623 for

synthesizing a group of formatted data packets (that include the symbol character data generated by the symbol decoding module); a data packet transmission circuit 625 for transmitting the group of data packets synthesized by the data packet synthesis module 623 to the base unit 503 (for retransmission to the host device); means (e.g. an object sensing circuit 627 and an object detection circuit 629) for producing a first activation control signal indicative of the detection of an object in at least a portion of the object detection field of the device; an SOS photoreceiving circuit 631 for detecting laser light directed thereto by positioning indicating optical element(s) (such as a lens and light guide or mirror as described above) and deriving timing signal T_{SOS} that is synchronized thereto; a timing signal generator circuit 633 that derives a timing signal T_{SLS} from the timing signal T_{SOS} , wherein the timing signal T_{SLS} is synchronized to the time interval when the laser beam (as redirected by the rotating polygon) provides the uni-directional single line scan (e.g., strikes the central stationary mirror 38C); a VLD duty cycle control circuit 635 that operates (under control of the control circuitry 611A) in the uni-directional (single scan line) scan mode of operation, to control the duty cycle of the VLD of the laser beam production module such that the laser beam is produced therefrom only during those intervals when the laser beam (as redirected by the rotating polygon 36) provides the uni-directional single line scan (e.g., strikes the central stationary mirror 38C); a manually-actuatable data transmission switch 637 for generating control activation signal A_4 in response to activation of the switch 637; a mode switch 639 for generating control activation signal A_5 in response to activation of the switch 639; state indications (e.g. LEDs) 170' that provide a visible indication of the operating state (e.g., object detection state, a bar code symbol presence detection state, bar code symbol reading state, and data transmission state) of the device 151'; and a power control circuit 641, operably coupled to the rechargeable battery supply unit (not shown) of the device 151', that automatically controls (i.e. manages) the availability of battery power to electrically-active components within the bar code symbol reading device when the device is operated in its hands-on mode of operation (i.e. removed from the scanner support stand) under a predefined set of operating conditions.

On Page 47, please amend the 2nd paragraph as follows:

Figures 9A, 9B, 9C and 9D, taken together, show a high level flow chart of an exemplary control process carried out by the control subsystem of the bar code reading device 151' of Figure 6 during the course of its programmed operation. Notably, in system control process shown in Figs. 9A to 9D, it has been assumed that the system employs a one-way RF data communication link between the bar code symbol reading device and its associated base unit, as shown in ~~Fig. 6~~ Figs. 6A and 6B. It is understood that alternative data communication links, based on 1-way and 2-way RF principles alike, can be used with excellent results.

On Page 52, please amend the 1st paragraph as follows:

In addition, it should be noted that the control process carried out by the control subsystem of the bar code reading device 151' of ~~Figure 6~~ Figures 6A and 6B during the course of its programmed operation as set forth above may be varied significantly without departing from the scope of the inventions as described earlier herein.